

SuperSOT4™ 15V NPN SILICON LOW SATURATION SWITCHING TRANSISTOR

SUMMARY

$V_{CE0}=15V$; $R_{SAT} = 29m\Omega$; $I_C = 5A$

DESCRIPTION

This new 4th generation ultra low saturation transistor utilises the Zetex matrix structure combined with advanced assembly techniques to give extremely low on state losses. This makes it ideal for high efficiency, low voltage switching applications.

FEATURES

- Extremely Low Equivalent On Resistance
- Extremely Low Saturation Voltage
- h_{FE} characterised up to 15A
- $I_C=5A$ Continuous Collector Current
- SOT23-6 package

APPLICATIONS

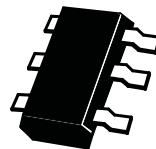
- DC - DC Converters
- Power Management Functions
- Power switches
- Motor control

ORDERING INFORMATION

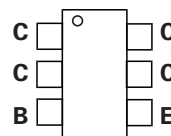
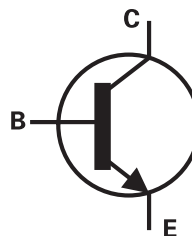
DEVICE	REEL SIZE (inches)	TAPE WIDTH (mm)	QUANTITY PER REEL
ZXT13N15DE6TA	7	8mm embossed	3000 units
ZXT13N15DE6TC	13	8mm embossed	10000 units

DEVICE MARKING

N15D



SOT23-6



Top View

ZXT13N15DE6

ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	LIMIT	UNIT
Collector-Base Voltage	V_{CBO}	40	V
Collector-Emitter Voltage	V_{CEO}	15	V
Emitter-Base Voltage	V_{EBO}	7.5	V
Peak Pulse Current	I_{CM}	15	A
Continuous Collector Current	I_C	5	A
Base Current	I_B	500	mA
Power Dissipation at $T_A=25^{\circ}\text{C}$ (a) Linear Derating Factor	P_D	1.1 8.8	W mW/ $^{\circ}\text{C}$
Power Dissipation at $T_A=25^{\circ}\text{C}$ (b) Linear Derating Factor	P_D	1.7 13.6	W mW/ $^{\circ}\text{C}$
Operating and Storage Temperature Range	$T_J:T_{stg}$	-55 to +150	$^{\circ}\text{C}$

THERMAL RESISTANCE

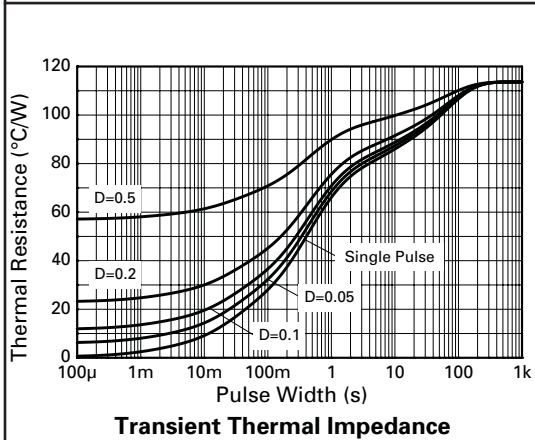
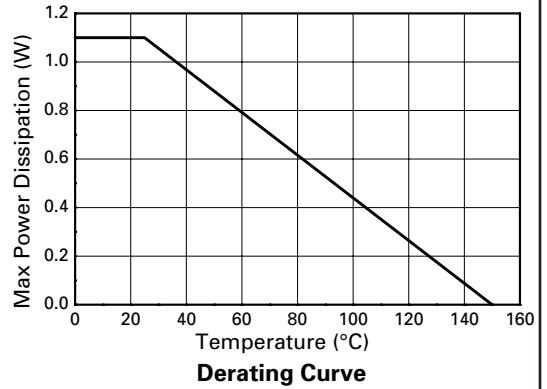
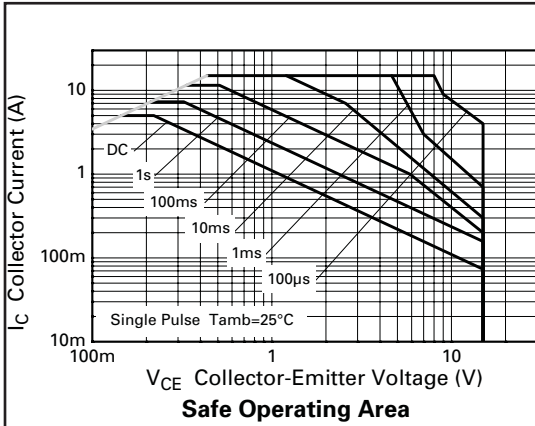
PARAMETER	SYMBOL	VALUE	UNIT
Junction to Ambient (a)	$R_{\theta JA}$	113	$^{\circ}\text{C}/\text{W}$
Junction to Ambient (b)	$R_{\theta JA}$	73	$^{\circ}\text{C}/\text{W}$

NOTES

(a) For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions

(b) For a device surface mounted on FR4 PCB measured at $t \leq 5$ secs.

TYPICAL CHARACTERISTICS



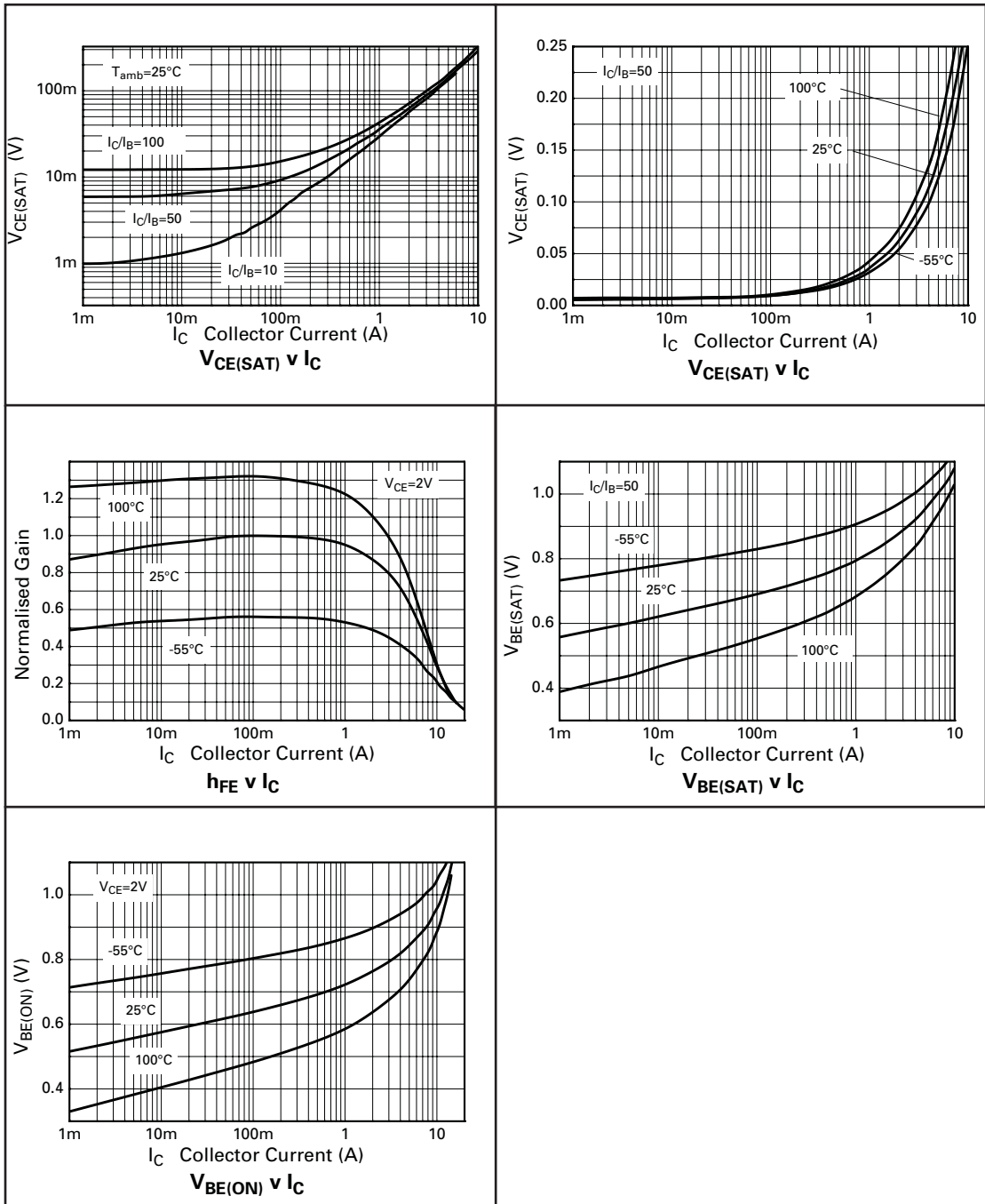
ZXT13N15DE6

ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated).

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	40	85		V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	15	22		V	$I_C = 10\text{mA}^*$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	7.5	8.5		V	$I_E = 100\mu\text{A}$
Collector Cut-Off Current	I_{CBO}			100	nA	$V_{CB} = 32\text{V}$
Emitter Cut-Off Current	I_{EBO}			100	nA	$V_{EB} = 6\text{V}$
Collector Emitter Cut-Off Current	I_{CES}			100	nA	$V_{CES} = 32\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		5.0 45 130 145	8 70 190 200	mV mV mV mV	$I_C = 0.1\text{A}, I_B = 10\text{mA}^*$ $I_C = 1\text{A}, I_B = 10\text{mA}^*$ $I_C = 4\text{A}, I_B = 40\text{mA}^*$ $I_C = 5\text{A}, I_B = 100\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$			1.0	V	$I_C = 5\text{A}, I_B = 100\text{mA}^*$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$			0.9	V	$I_C = 5\text{A}, V_{CE} = 2\text{V}^*$
Static Forward Current Transfer Ratio	h_{FE}	250 300 200 20	400 450 300 50	900		$I_C = 10\text{mA}, V_{CE} = 2\text{V}^*$ $I_C = 1\text{A}, V_{CE} = 2\text{V}^*$ $I_C = 5\text{A}, V_{CE} = 2\text{V}^*$ $I_C = 15\text{A}, V_{CE} = 2\text{V}^*$
Transition Frequency	f_T		72		MHz	$I_C = 50\text{mA}, V_{CE} = 10\text{V}$ $f = 50\text{MHz}$
Output Capacitance	C_{obo}		76		pF	$V_{CB} = 10\text{V}, f = 1\text{MHz}$
Turn-On Time	$t_{(on)}$		92		ns	$V_{CC} = 10\text{V}, I_C = 3\text{A}$ $I_{B1} = I_{B2} = 60\text{mA}$
Turn-Off Time	$t_{(off)}$		340		ns	

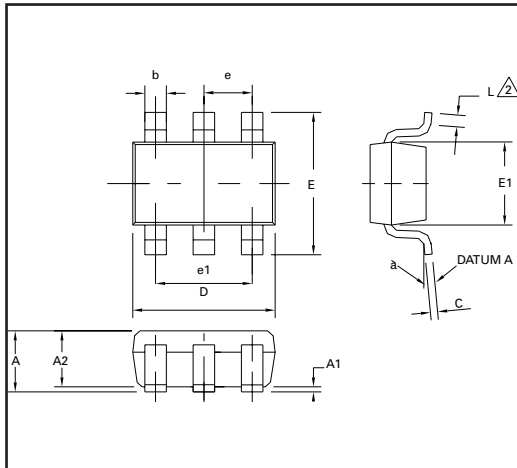
*Measured under pulsed conditions. Pulse width=300 μs . Duty cycle $\leq 2\%$

TYPICAL CHARACTERISTICS

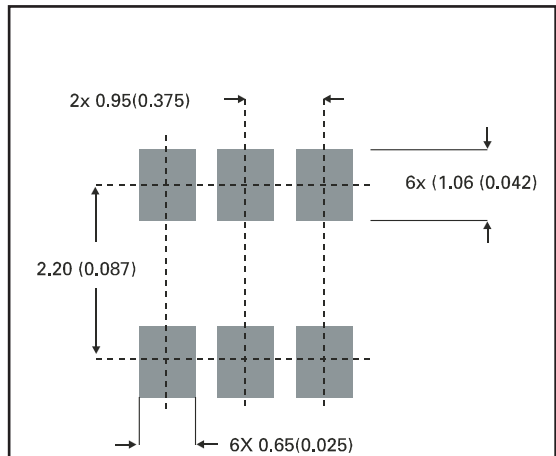


ZXT13N15DE6

PACKAGE DIMENSIONS



PAD LAYOUT DETAILS



DIM	Millimetres		Inches	
	Min	Max	Min	Max
A	0.90	1.45	0.35	0.057
A1	0.00	0.15	0	0.006
A2	0.90	1.30	0.035	0.051
b	0.35	0.50	0.014	0.019
C	0.09	0.20	0.0035	0.008
D	2.80	3.00	0.110	0.118
E	2.60	3.00	0.102	0.118
E1	1.50	1.75	0.059	0.069
L	0.10	0.60	0.004	0.002
e	0.95 REF		0.037 REF	
e1	1.90 REF		0.074 REF	
L	0°	10°	0°	10°



Zetex plc.
Fields New Road, Chadderton, Oldham, OL9-8NP, United Kingdom.
Telephone: (44)161 622 4422 (Sales), (44)161 622 4444 (General Enquiries)
Fax: (44)161 622 4420

Zetex GmbH
Streitfeldstraße 19
D-81673 München
Germany
Telefon: (49) 89 45 49 49 0
Fax: (49) 89 45 49 49 49

Zetex Inc.
47 Mall Drive, Unit 4
Commack NY 11725
USA
Telephone: (516) 543-7100
Fax: (516) 864-7630

Zetex (Asia) Ltd.
3510 Metroplaza, Tower 2
Hing Fong Road,
Kwai Fong, Hong Kong
Telephone: (852) 26100 611
Fax: (852) 24250 494

These are supported by
agents and distributors in
major countries world-wide
© Zetex plc 1999

Internet: <http://www.zetex.com>

This publication is issued to provide outline information only which (unless agreed by the Company in writing) may not be used, applied or reproduced for any purpose or form part of any order or contract or be regarded as a representation relating to the products or services concerned. The Company reserves the right to alter without notice the specification, design, price or conditions of supply of any product or service.

ISSUE 1 - DECEMBER 1999

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Diodes Incorporated:](#)

[ZXT13N15DE6TC](#) [ZXT13N15DE6TA](#)